

# Sodium Hydroxide

## Safe Handling Guideline

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URL: <http://www-group.slac.stanford.edu/esh/eshmanual/references/chemsafetyGuideSodiumHydroxide.pdf>

### Synonyms

Caustic soda, lye, soda lye, sodium hydrate

### Reactivity and Physical Concerns

Incompatible with water, acids, flammable liquids, organic halogens, metals such as aluminum, tin, and zinc, and nitromethane. The substance is a strong base; it reacts violently with acid and is corrosive in moist air to metals like zinc, aluminum, tin, and lead, forming combustible/explosive hydrogen gas. Reacts with ammonium salts to produce ammonia, causing fire hazard. Attacks some forms of plastics, rubber, or coatings. Rapidly absorbs carbon dioxide and water from air. Contact with moisture or water may generate sufficient heat to ignite combustible substances.

### Exposure Hazards

#### Routes of Exposure

Inhalation, ingestion, skin contact, eye contact

Sodium hydroxide causes severe irritation to eyes, skin, mucous membrane; pneumonitis; eye and skin burns; and temporary loss of hair. The substance is very corrosive to the eyes, the skin, and the respiratory tract. Corrosive on ingestion. Inhalation of an aerosol of the substance may cause lung edema. Inhalation may result in a burning sensation, sore throat, cough, labored breathing, and shortness of breath. Symptoms may be delayed. Skin contact may result in redness, pain, serious skin burns, and blisters. Eye contact may result in redness, pain, blurred vision, and severe deep burns. Ingestion may result in a burning sensation, abdominal pain, shock, or collapse.

#### Chronic Exposure

Repeated or prolonged contact with skin may cause dermatitis. Caustic dusts are irritating to the upper respiratory system. Prolonged exposure to high concentrations may cause discomfort and ulceration of nasal passages.

#### First Aid

**If inhaled**, move victim to fresh air, rest and maintain a half-upright position. Use artificial respiration if necessary. Obtain medical attention immediately. **If skin contact occurs**, remove contaminated clothes, rinse skin with plenty of cold water or shower. Obtain medical attention. **If eye contact occurs**, first rinse with plenty of cold water for several minutes, then obtain medical attention immediately. **If ingested**, rinse mouth. **Do not induce vomiting**. Give plenty of water to drink. Obtain medical attention immediately. (See [Chemical Safety: Accidental Exposure Requirements](#) [SLAC-I-730-0A09S-041].)

### Exposure Limits

- Permissible exposure limit: 2 mg/m<sup>3</sup> (OSHA TWA)
- NIOSH recommended exposure limit: 2 mg/m<sup>3</sup> (C)
- Immediately dangerous to life and health: 10 ppm

## Exposure Controls

### Engineering Controls

**Prevent generation of dusts. Avoid all contact.** Local exhaust ventilation or breathing protection is required. Secondary containment of all storage and use is required if an exposure risk to employees or the environment is present.

### Administrative Controls

Procedures should be developed for the safe use and handling of sodium hydroxide in all applications. ESHQ can provide information and guidance. Depending upon quantities, certain regulatory permits and/or registrations may be required. Personnel working with the materials must receive detailed training on the hazards, safe use, and emergency procedures.

### Personal Protective Equipment

Prevent skin/eye contact through the use of impervious gloves, clothing, boots, apron, and eye goggles or full face shield. If the airborne exposure limit may be exceeded and engineering controls are not feasible, wear appropriate respiratory protection.

### Disposal

Material is disposed of as hazardous waste. Contact the Waste Management Group for specific disposal requirements and procedures. Containers and other materials that are contaminated with sodium hydroxide must also be treated as hazardous waste.

### Medical Monitoring (if applicable)

The skin, eyes, and respiratory tract should receive special attention in any placement or periodic examination. NIOSH recommends that workers subject to sodium hydroxide exposure have comprehensive pre-placement medical examinations. Medical examinations should be made available promptly to all workers with signs or symptoms of skin, eye, or upper respiratory tract irritation resulting from exposure to sodium hydroxide.

### Emergency Response

In the event of a spill that poses a threat to health and/or the environment, immediately evacuate the area and call 911. Then call SLAC Site Security (ext. 5555 or 650-926-5555 from a cell phone) and notify your supervisor.

For other spills, notify your supervisor then SLAC Site Security; these may be cleaned up with appropriate spill response supplies by trained personnel who have been authorized via work planning and control. (See [Spills: Response, Cleanup, and Reporting Procedure](#) [SLAC-I-750-0A16C-006].)

## Standards and Regulations

- OSHA. PEL: [29 CFR 1910.1000 Table Z-1](#); Respiratory Protection: [29 CFR 1910.134](#)
- EPA. Release: [40 CFR 355.40](#), 302, 116.4; Waste: [40 CFR 261.21-261.24](#)
- *California Fire Code*, Chapters 27 through 41 ([24 CCR Part 9](#))

## References

- NLM. [TOXNET: Toxicology Data Network](#)
- NIOSH. *NIOSH Pocket Guide to Chemical Hazards* (NIOSH 2005-151), "[Sodium Hydroxide](#)"
- NIOSH. International Chemical Safety Card: Sodium Hydroxide ([ICSC 0360](#))